In the claims:

1. (original) A method for transforming a digital signal from the time domain into the frequency domain and vice versa using a transformation function comprising a transformation matrix, the digital signal comprising data symbols which are grouped into a plurality of blocks, each block comprising a predefined number of the data symbols, the method comprising:

transforming two blocks of the digital signal by one transforming element, wherein the transforming element corresponds to a block-diagonal matrix comprising two sub-matrices, wherein each sub-matrix comprises the transformation matrix and the transforming element comprises a plurality of lifting stages and wherein each lifting stage comprises the processing of blocks of the digital signal by an auxiliary transformation and by a rounding unit.

2. (original) The method of claim 1, wherein the transformation function is a DCT-I transformation function, DCT-IV transformation function, DFT-I transformation function, DFT-IV transformation function, DST-I transformation function, DST-IV transformation function, DWT-I transformation function or DWT-IV transformation function.

3. (currently amended) The method of claim 1 ~~or 2~~, wherein each lifting stage corresponds to a lifting matrix, wherein the lifting matrix is a block-triangular matrix comprising four sub-matrices with two invertible integer matrices as two of the sub-matrices in one diagonal, and with the transformation matrix and

a zero as the other two of the sub-matrices in the other diagonal.

4. (original) The method of claim 3, wherein the invertible integer matrices in each lifting matrix are identity matrices or negative identity matrices.

5. (original) The method of claim 1, wherein the transforming element comprises three lifting stages.

6. (currently amended) The method of ~~claims 1 to 5~~ claim 1, wherein an audio signal or a video signal is used as the digital signal.

7. (original) A device for transforming a digital signal from the time domain into the frequency domain and vice versa using a transformation function comprising a transformation matrix, the digital signal comprising data symbols and being divided into a plurality of blocks, each block comprising a predefined number of the data symbols, the device comprising:

a transformation unit for transforming two blocks of the digital signal by one transforming element, wherein the transforming element corresponds to a block-diagonal matrix comprising two sub-matrices, wherein each sub-block comprises the transformation matrix and the transforming element comprises a plurality of lifting stages.

8. (original) The device of claim 7, wherein the transformation unit comprises auxiliary transformation units for each lifting stage for processing the blocks of the digital signal.

9. (currently amended) The device of one of the claims 7 ~~or 8~~, wherein the transformation unit comprises rounding units for each lifting stage for processing the blocks of the digital signal.

10. (currently amended) The device of ~~any one of the claims 7-9~~ claim 7, wherein the transformation unit comprises:

a modified discrete cosine transform device coupled to receive the a plurality of data blocks and configured to domain transform each data block into MDCT coefficients;

a quantizer coupled to receive each of the MDCT coefficients, the quantizer operable to produce, in response, quantized MDCT coefficients;

a bit stream encoder coupled to receive the quantized MDCT coefficients, the bit stream producing, in response, a perceptually coded bit stream;

an inverse quantizer coupled to receive the quantized MDCT coefficients, the inverse quantizer operable to restore the MDCT coefficients to an non-quantized state; and

a rounding unit coupled to receive the restored MDCT coefficients and operable to produce integer value MDCT coefficients.

11. (original) The device of claim 10, wherein the transformation unit further comprises:

an inverse modified discrete cosine transform device coupled to receive the data blocks and operable to produce, in response, IntMDCT coefficients;

means for computing the difference between respective IntMDCT coefficients and integer value MDCT coefficients to produce respective residual MDCT coefficients; and

an entropy coder coupled to receive the residual MDCT coefficients and operable to generate, in response, a lossless enhancement bitstream.

12. (original) The device of claim 11, wherein the transformation unit further comprises:

a bitstream decoder coupled to receive the perceptually coded bitstream and operable to output, in response, a decoded bitstream;

an inverse quantizer coupled to receive the decoded bitstream and to produce, in response, restored MDCT coefficients;

a rounding unit coupled to receive the restored MDCT coefficients and operable to round each MDCT coefficient to an integer value; and

an inverse MDCT device coupled to receive the restored MDCT stream, and to produce in generate in response, a reconstructed copy of the perceptually coded signal.

13. (original) The device of claim 12, wherein the transformation unit comprises:

an entropy decoder coupled to receive the lossless bit stream and operable to generate, in response, residual IntMDCT coefficients;

means for adding the residual IntMDCT coefficients to the integer value MDCT coefficients to produce IntMDCT coefficients; and

an inverse IntMDCT device coupled to receive the summation of the integer value MDCT coefficients and the IntMDCT coefficients to produce a reconstructed copy of the losslessly coded audio signal.

14. (original) A computer readable medium having a program recorded thereon, wherein the program is adapted to make a computer perform a method for transforming a digital signal from the time domain into the frequency domain and vice versa using a transformation function comprising a transformation matrix, the digital signal comprising data symbols and being divided into a plurality of blocks, each block comprising a predefined number of the data symbols, the computer readable medium comprising:

code for transforming two blocks of the digital signal by one transforming element, wherein the transforming element corresponds to a block-diagonal matrix comprising two sub-matrices, wherein each sub-block comprises the transformation matrix and the transforming element comprises a plurality of lifting stages and wherein each lifting stage comprises the processing of sub-blocks of the digital signal by an auxiliary transformation and by a rounding unit.

15. (new) The method of claim 2, wherein each lifting stage corresponds to a lifting matrix, wherein the lifting matrix is a block-triangular matrix comprising four sub-matrices with two invertible integer matrices as two of the sub-matrices in one diagonal, and with the transformation matrix and a zero as the other two of the sub-matrices in the other diagonal.

16. (new) The method of claim 15, wherein the invertible integer matrices in each lifting matrix are identity matrices or negative identity matrices..

17. (new) The device of one of the claims 8, wherein the transformation unit comprises rounding units for each lifting stage for processing the blocks of the digital signal.